Plant Assets, Natural Resources, and Intangibles

Chapter 10

Wild and Shaw

Fundamental Accounting Principles

25th Edition

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Chapter 10 Learning Objectives

CONCEPTUAL

C1 Compute the cost of plant assets.

C2 Explain depreciation for partial years and changes in estimates.

C3 Distinguish between revenue and capital expenditures, and account for them.

ANALYTICAL

A1 Compute total asset turnover and apply it to analyze a company's use of assets.

PROCEDURAL

P1 Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

P2 Account for asset disposal through discarding or selling an asset.

P3 Account for natural resource assets and their depletion.

P4 Account for intangible assets.

P5 *Appendix 10A*—Account for asset exchanges.

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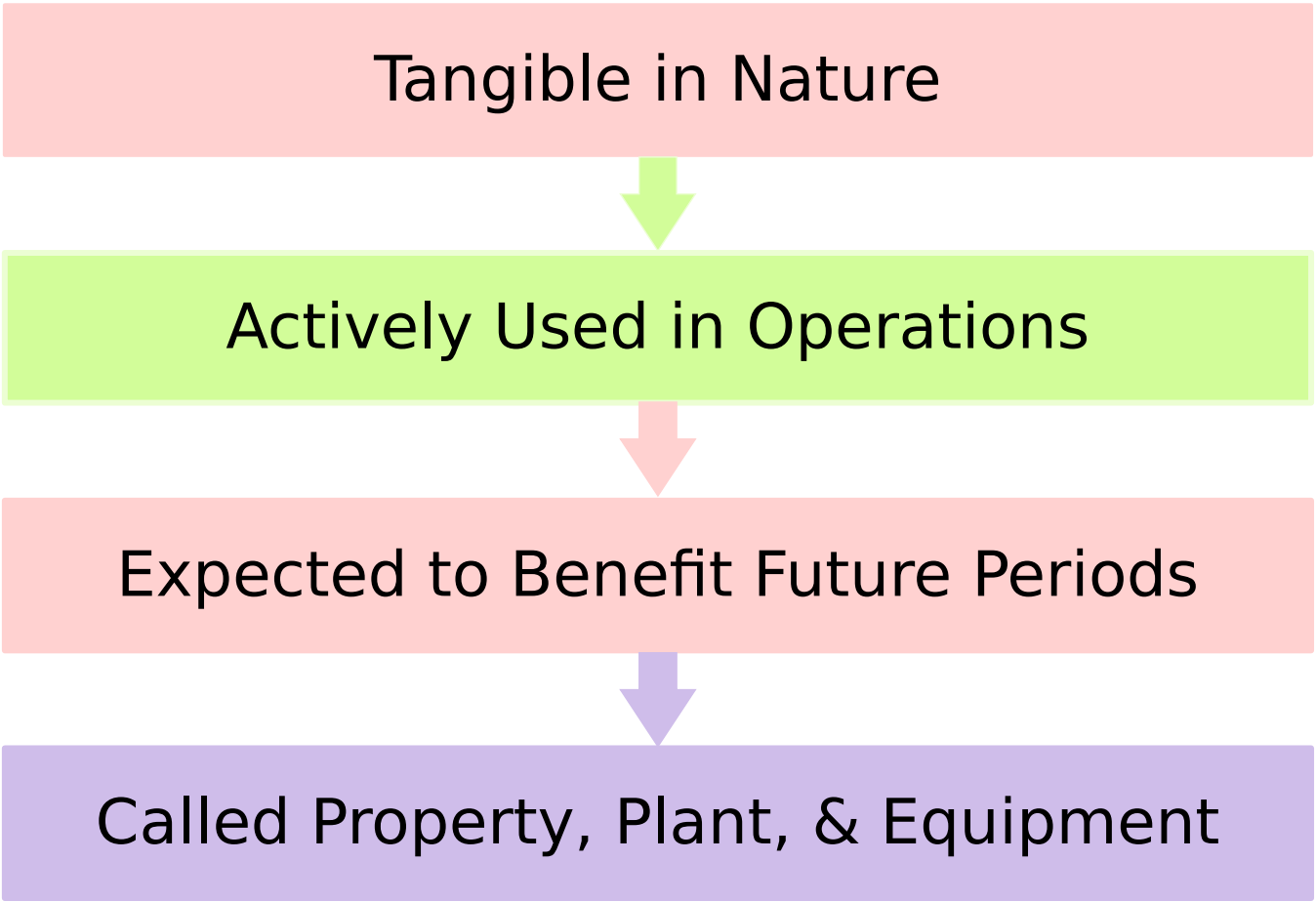
Plant Assets: Definition



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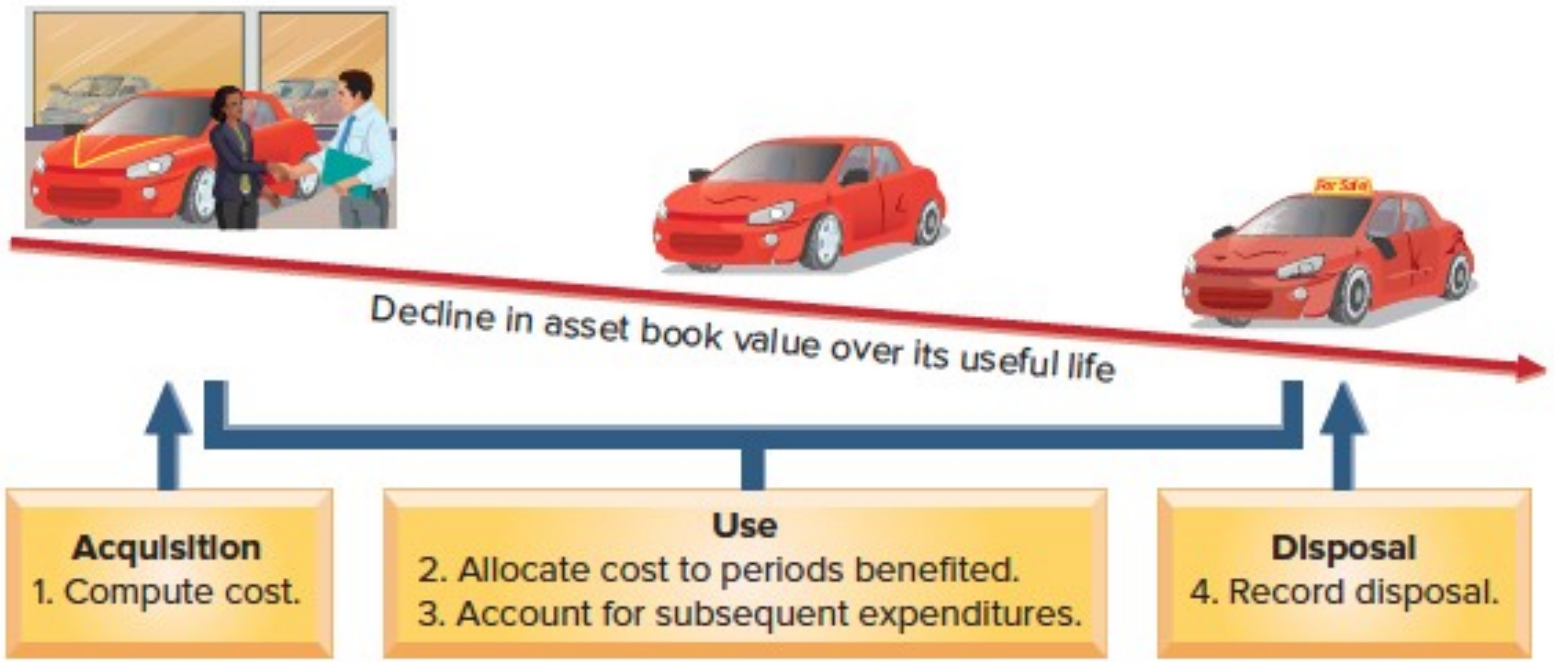
Plant Assets: Four Issues

Exhibit 10.2



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Learning Objective C1

Compute the cost of plant assets.

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Cost Determination

Acquisition cost includes all expenditures necessary to get the asset in place and ready for use

Learning Objective C1: Compute the cost of plant assets.

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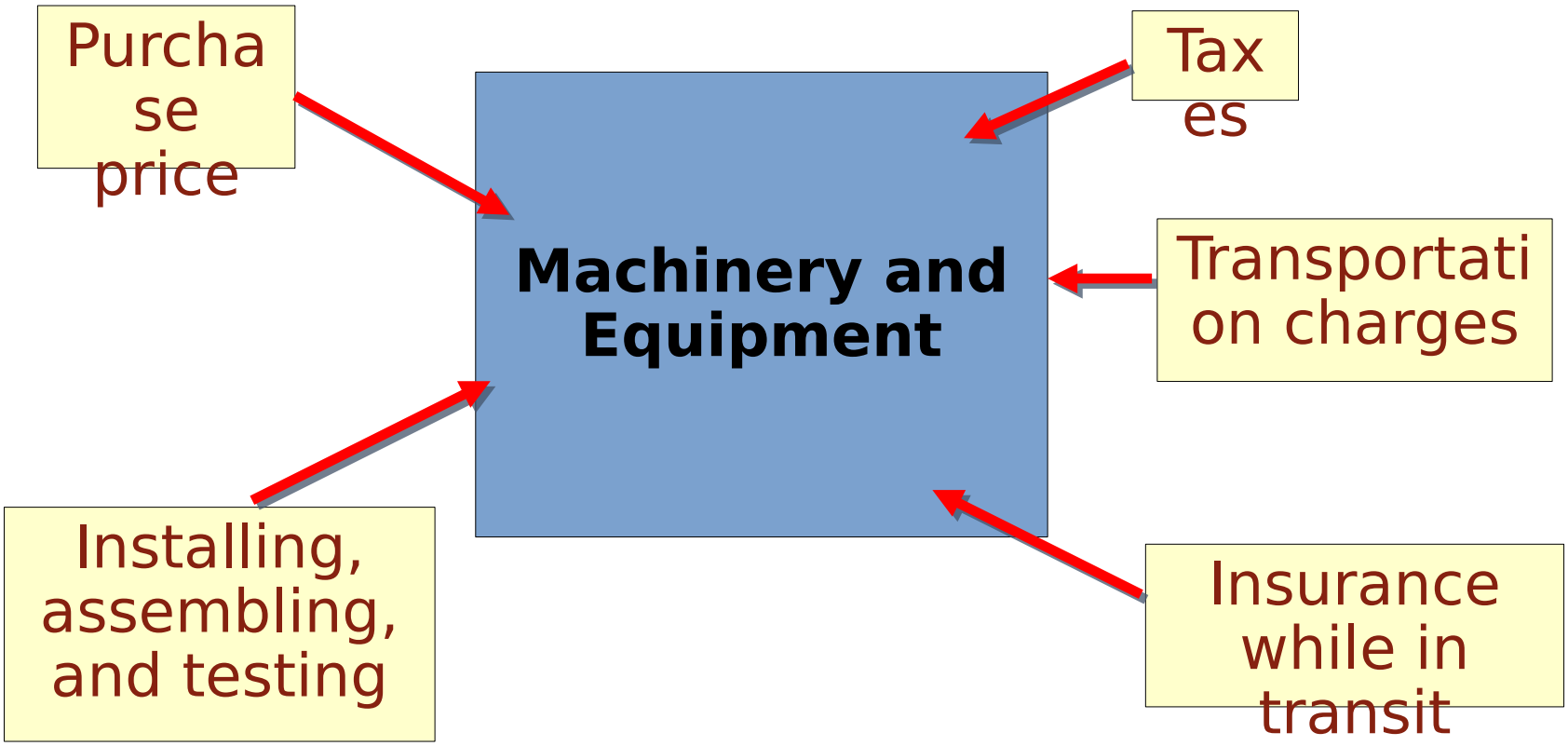
Machinery and Equipment



Learning Objective C1: Compute the cost of plant assets.

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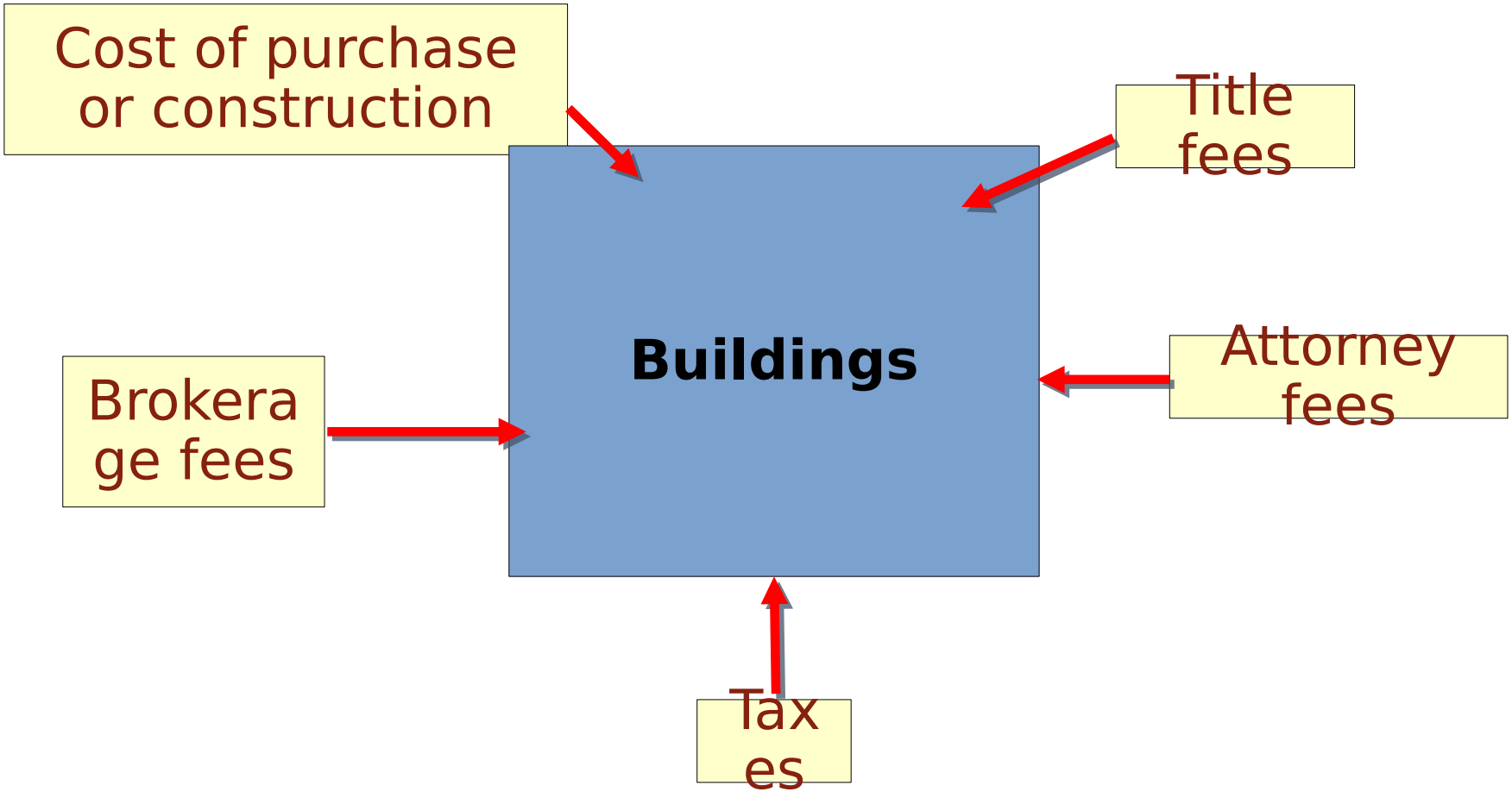
Buildings



Learning Objective C1: Compute the cost of plant assets.

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Land Improvements

Parking lots, driveways, fences, walkways, and lighting systems.

Depreciate over useful life of improvements.

Learning Objective C1: Compute the cost of plant assets.

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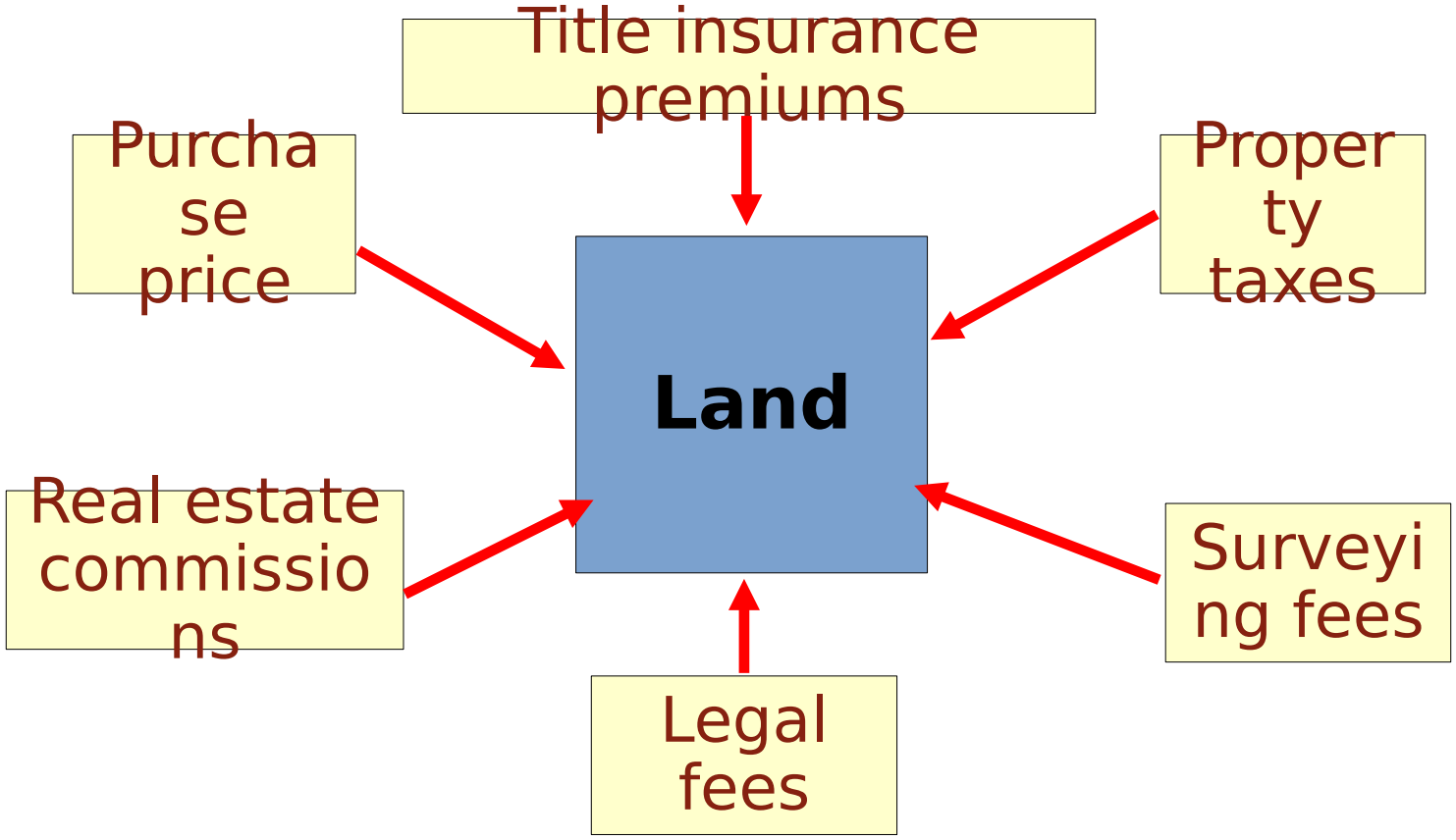
Land



Land is **not** depreciable.

Learning Objective C1: Compute the cost of plant assets.

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Lump-Sum Purchase

The total cost of a combined purchase of land and building is allocated based of their relative market values.

CarMax paid $90,000 cash to acquire a group of items consisting of land appraised at $40,000 and a building appraised at $60,000. The $90,000 cost will be allocated on the basis of appraised values as shown:

Exhibit 10.4

Appraised Value		Percent of Total	Apportioned Cost
Building	$ 60,000	60% ($60,000/$100,000)	$54,000 ($90,000 × 60%)
Land	40,000	40 ($40,000/$100,000)	36,000 ($90,000 × 40%)
Totals	$100,000	100%	$ 90,000

Entry for lump-sum cash purchase:

Building	54,000	
Land	36,000	
Cash		90,000

Lea
plant assets.

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Learning Objective P1

Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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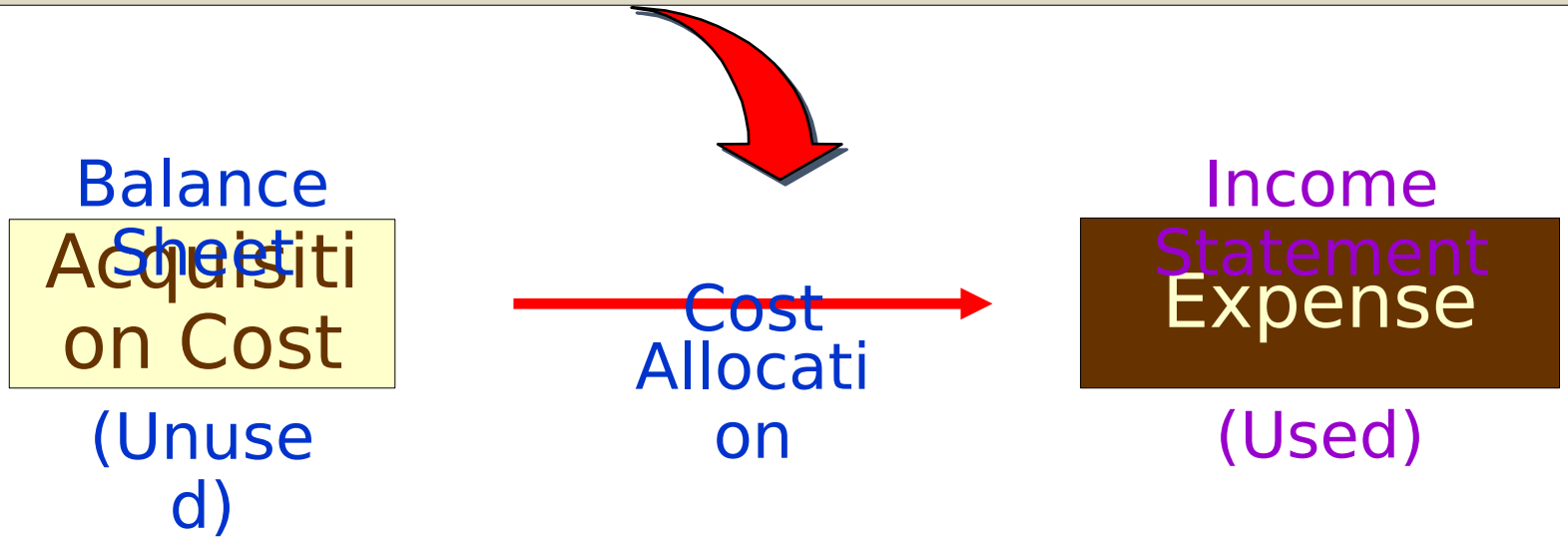
Depreciation

Depreciation is the process of allocating the cost of a plant asset to expense in the accounting periods benefiting from its use.



Learning Objective P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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Factors in Computing Depreciation

The calculation of depreciation requires three amounts for each asset:

1. **Cost**
2. **Salvage Value**
3. **Useful Life**

Learning Objective P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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Depreciation Methods

1. **Straight-line**
2. **Units-of-production**
3. **Declining-balance**

Exhibit 10.5

Cost	$10,000
Salvage value	1,000
Depreciable cost	$ 9,000

Useful life:	
Accounting periods	5 years
Units inspected	36,000 shoes

Learning Objective P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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Straight-Line Method: Example

Dec. 31	Depreciation Expense	1,800	
	Accumulated Depreciation—Machinery		1,800
	Record annual depreciation.		

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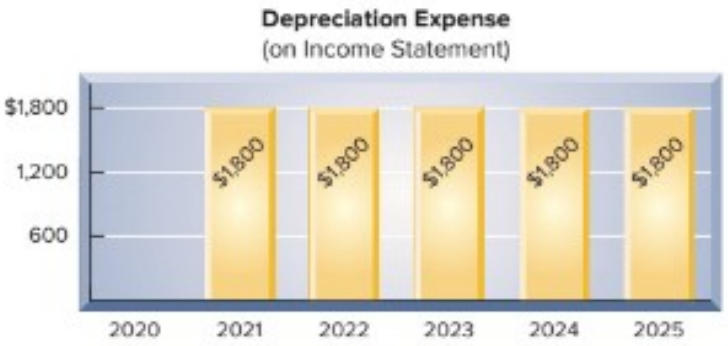
Straight-Line Method: Balance Sheet

Exhibit 10.7



Balance Sheet Presentation		
Machinery	$ 10,000	
Less: accumulated depreciation	3,600	$ 6,400

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Straight-Line Depreciation Schedule

Exhibit 10.8

Annual Period	Depreciation for the Period: Depreciable Cost*	Depreciation for the Period: Depreciation Rate	Depreciation for the Period: Depreciation Expense	End of Period: Accumulated Depreciation	End of Period: Book Value†
2020	—	—	—	—	$10,000
2021	$9,000	20%	$1,800	$1,800	8,200
2022	9,000	20	1,800	3,600	6,400
2023	9,000	20	1,800	5,400	4,600
2024	9,000	20	1,800	7,200	2,800
2025	9,000	20	1,800	9,000	1,000
			$9,000 ← $10,000 cost – $1,000 salvage		

*$10,000 – $1,000. †Book value is total cost minus accumulated depreciation.

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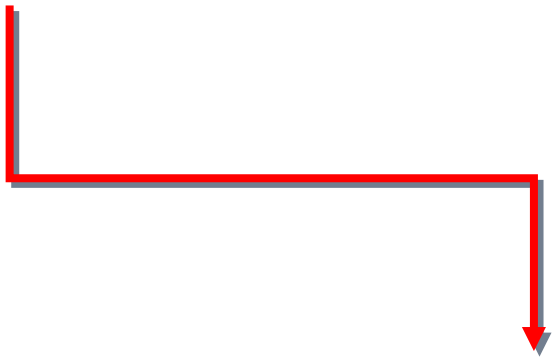
Units-of-Production Method: Two-Step Process



Learning Objective P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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Units-of-Production Method: Example

Cost	$10,000
Salvage value	1,000
Depreciable cost	$9,000
Useful life	
Accounting periods	5 years
Units inspected	36,000 shoes

Assume that 7,000 units were inspected during the first year. Depreciation would be calculated as follows:

Learning Objective P1: Compute and record depreciation using the straight-line, units-of-production, and declining-balance methods.

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Units-of-Production Depreciation Schedule

Exhibit 10.10

Annual Period	Depreciation for the Period: Number of Units	Depreciation for the Period: Depreciation per Unit	Depreciation for the Period: Depreciation Expense	End of Period: Accumulated Depreciation	End of Period: Book Value
2020	—	—	—	—	$10,000
2021	7,000	$0.25	$1,750	$1,750	8,250
2022	8,000	0.25	2,000	3,750	6,250
2023	9,000	0.25	2,250	6,000	4,000
2024	7,000	0.25	1,750	7,750	2,250
2025	5,000	0.25	1,250	9,000	1,000
	36,000 units	$10,000 cost – $1,000 salvage	$9,000	Salvage value is not depreciated.	

Units produced and sold during the period.

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Declining-Balance Method: Three Steps

Cost	$10,000
Salvage value	1,000
Depreciable cost	$9,000
Useful life	
Accounting periods	5 years
Units inspected	36,000 shoes

Exhibit 10.11

Step 1 **Straight-line rate = 100% ÷ Useful life** = 100% ÷ 5 years = 20%

Step 2 **Double-declining-balance rate = 2 × Straight-line rate** = 2 × 20% = 40%

Step 3 **Depreciation expense = Double-declining-balance rate × Beginning-period book value**

40% × $10,000 = $4,000 (for 2021)

*In simple form: DDB depreciation = (2 × Beginning-period book value)/Useful life.

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Double-Declining-Balance Method: Schedule

Exhibit 10.12

Annual Period	Depreciation for the Period: Beginning-of-Period Book Value	Depreciation for the Period: Depreciation Rate	Depreciation for the Period: Depreciation Expense	End of Period: Accumulated Depreciation	End of Period: Book Value
2020	—	—	—	—	$10,000
2021	$10,000	40%	$4,000	$4,000	6,000
2022	6,000	40	2,400	6,400	3,600
2023	3,600	40	1,440	7,840	2,160
2024	2,160	40	864	8,704	1,296
2025	1,296	40	296	9,000	1,000
		$10,000 cost – $1,000 salvage →	$9,000	Salvage value is not depreciated. →	

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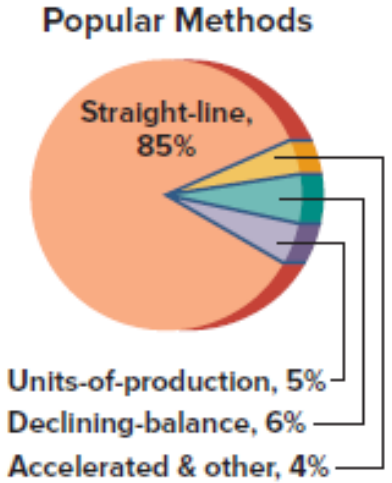
Comparing Depreciation Methods

Period	Straight-Line	Units-of-Production	Double-Declining-Balance
2021	$1,800	$1,750	$4,000
2022	1,800	2,000	2,400
2023	1,800	2,250	1,440
2024	1,800	1,750	864
2025	1,800	1,250	296
Totals	$9,000	$9,000	$9,000

Exhibit 10.13

Methods Used by Companies



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Depreciation for Tax Reporting

Most corporations use the Modified Accelerated Cost Recovery System (MACRS) for tax purposes.

MACRS is not acceptable for financial reporting because it does not consider an asset's useful life or salvage value.

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Learning Objective C2

Explain depreciation for partial years and changes in estimates.

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Partial-Year Depreciation

When a plant asset is purchased (or sold) during the year, depreciation is calculated for the fraction of the year the asset is owned.

Cost	$ 10,000
Salvage value	1,000
Depreciable cost	$ 9,000
Useful life	
Accounting periods	5 years
Units inspected	36,000 units

Assume our machinery was purchased on October 1, 2020. Let's calculate depreciation expense for 2020 assuming we use straight-line depreciation.

Learning Objective C2: Explain depreciation for partial years and changes in estimates.

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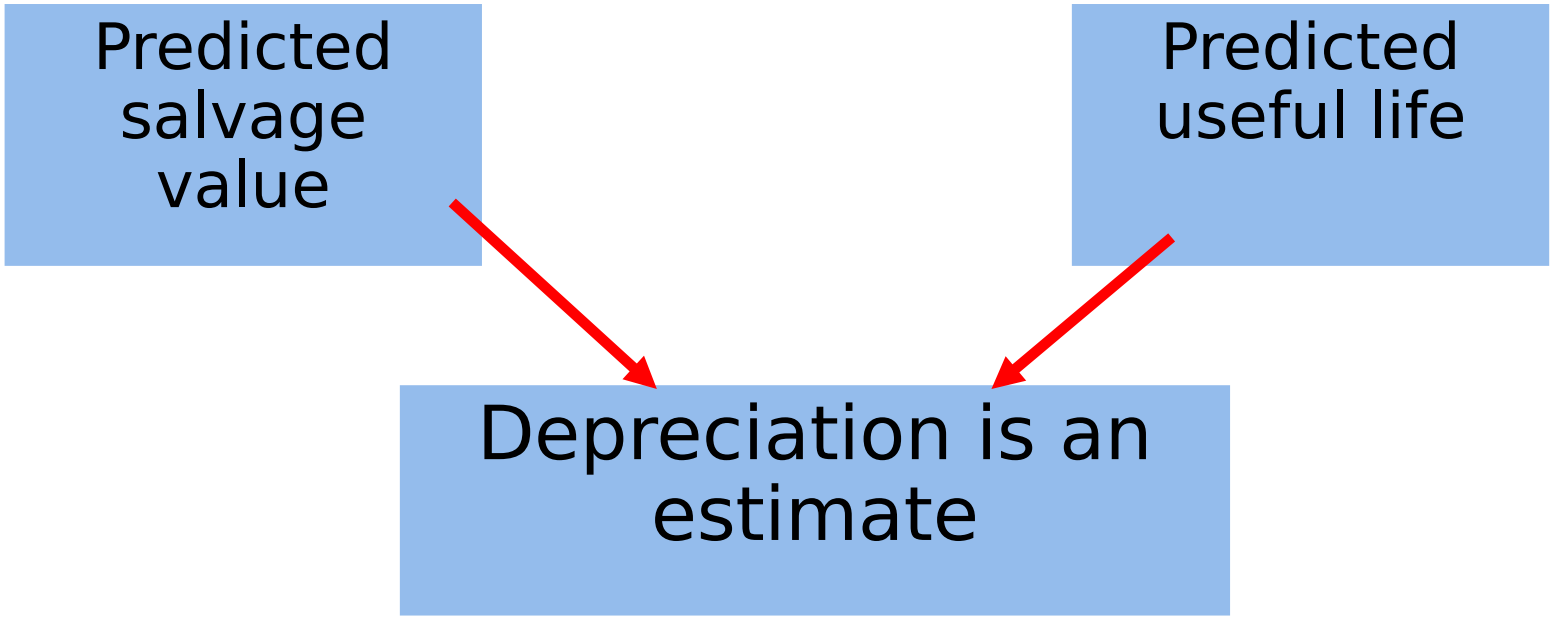
Changes in Estimates



Over the life of an asset, new information may come to light that indicates the original estimates were inaccurate.

Learning Objective C2: Explain depreciation for partial years and changes in estimates.

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Changes in Estimates for Depreciation

Let's look at our machinery from the previous examples and assume that at the beginning of the asset's third year, its book value is $6,400 ($10,000 cost less $3,600 accumulated depreciation using straight-line depreciation). At that time, it is determined that the machinery will have a remaining useful life of 4 years, and the estimated salvage value will be revised downward from $1,000 to $400.

Learning Objective C2: Explain depreciation for partial years and changes in estimates.

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Learning Objective C3

Distinguish between revenue and capital expenditures, and account for them.

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Additional Expenditures

Revenue expenditures

- do not materially increase the plant asset's life or capabilities.
- Recorded as an expense in the current period.
- Reported on the income statement.

Capital expenditures

- Provide benefits for longer than the current period.
- Recorded as an addition to the asset account.
- Reported on the balance sheet.

Learning Objective C3: Distinguish between revenue and capital expenditures, and account for them.

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Revenue and Capital Expenditures

Type of Expenditure	Capital or Revenue	Identifying Characteristics
Ordinary Repairs	Revenue	1. Maintains normal operating condition. 2. Does not increase productivity. 3. Does not extend life beyond original estimate.
Betterments and Extraordinary Repairs	Capital	1. Major overhauls or partial replacements. 2. Extends life beyond original estimate.

Learning Objective C3: Distinguish between revenue and capital expenditures, and account for them.

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Revenue and Capital Expenditures: Journal Entries

Ordinary Repairs

Dec. 31	Repairs Expense	9,500	
	Cash		9,500
	Record ordinary repairs of equipment.		

Betterments (Improvements)

Jan. 2	Machinery	1,800	
	Cash		1,800
	Record installation of automated system.		

Learning Objective C3: Distinguish between revenue and capital expenditures, and account for them.

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Learning Objective P2

Account for asset disposal through discarding or selling an asset.

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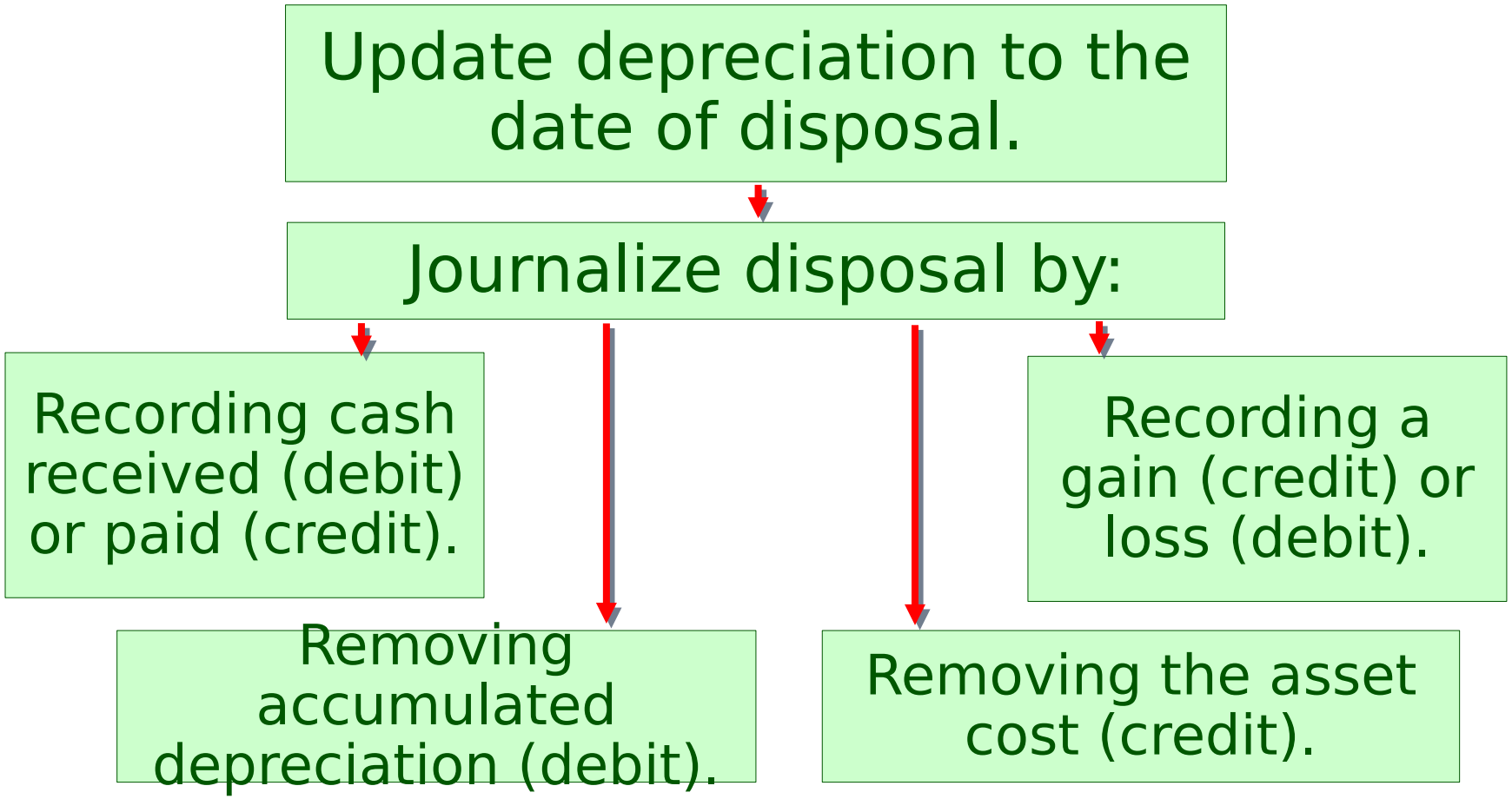
Disposals of Plant Assets


Update depreciation to the date of disposal.
Journalize disposal by:
Recording cash received (debit) or paid (credit).
Removing accumulated depreciation (debit).
Removing the asset cost (credit).
Recording a gain (credit) or loss (debit).

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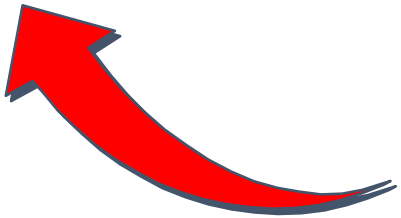
Discarding Plant Assets

If Cash > BV, record a gain (credit).

If Cash < BV, record a loss (debit).

If Cash = BV, no gain or loss.



Recording cash received (debit) or paid (credit).

Recording a gain (credit) or loss (debit).

Removing accumulated depreciation (debit).

Removing the asset cost (credit).

Learning Objective P2: Account for asset disposal through discarding or selling an asset.

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Discarding Plant Assets: Asset Fully Depreciated

- A machine costing $9,000, with accumulated depreciation of $9,000 on December 31 of the previous year, was discarded on June 5th of the current year.
- The company is depreciating the equipment using the straight-line method over eight years with zero salvage value.

Steps 1-4:

June 5	Accumulated Depreciation—Machinery	9,000	
	Machinery		9,000
	Discarding of fully depreciated machinery.		

Learning Objective P2: Account for asset disposal through discarding or selling an asset.

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Discarding Plant Assets: Asset Not Fully Depreciated

- Equipment costing $8,000, with accumulated depreciation of $6,000 on 12/31 of previous year, was discarded on 7/1.
- The company is using straight-line depreciation over eight years with zero salvage value.

Step 1: Record depreciation expense to July 1.

July 1	Depreciation Expense	500	
	Accumulated Depreciation—Equipment		500
	Record 6 months' depreciation ($1,000 × 6 / 12).		

Steps 2-4:

July 1	Accumulated Depreciation—Equipment	6,500	
	Loss on Disposal of Equipment	1,500	
	Equipment		8,000
	Discard equipment with a $1,500 book value.		

Learning Objective P2: Account for asset disposal through discarding or selling an asset.

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Selling Plant Assets – At Book Value

- 3/31, BTO sells equipment that originally cost $16,000 and has accumulated depreciation of $12,000 at 12/31 of the prior year.
- BTO uses straight-line depreciation at $4,000 per year.
- The equipment is sold for $3,000 cash.

Step 1: Record depreciation expense to March 31.

Mar. 31	Depreciation Expense	1,000	
	Accumulated Depreciation—Equipment		1,000
	Record 3 months' depreciation ($4,000 × 3 / 12).		

Step 2: Record sale of asset at book value ($16,000 − $13,000 = $3,000)

Mar. 31	Cash	3,000	
	Accumulated Depreciation—Equipment	13,000	
	Equipment		16,000
	Record sale of equipment for no gain or loss.		

Learnin
selling an asset.

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Selling Plant Assets – Above Book Value

- 3/31, BTO sells equipment that originally cost $16,000 and has accumulated depreciation of $12,000 at 12/31 of the prior year.
- BTO uses straight-line depreciation at $4,000 per year.
- The equipment is sold for $7,000 cash.

Step 1: Update depreciation to March 31st.

Mar. 31	Depreciation Expense	1,000	
	Accumulated Depreciation—Equipment		1,000
	Record 3 months' depreciation ($4,000 × 3 / 12).		

Step 2: Record sale of asset at a gain. ($7,000 − $3,000 = $4,000 gain)

Mar. 31	Cash	7,000	
	Accumulated Depreciation—Equipment	13,000	
	Gain on Disposal of Equipment		4,000
	Equipment		16,000
	Record sale of equipment for a $4,000 gain.		

Learning selling an asset.

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Selling Plant Assets – Below Book Value

- 3/31, BTO sells equipment that originally cost $16,000 and has accumulated depreciation of $12,000 at 12/31 of the prior year.
- BTO uses straight-line depreciation at $4,000 per year.
- The equipment is sold for $2,500 cash.

Step 1: Update depreciation to March 31st.

Mar. 31	Depreciation Expense	1,000	
	Accumulated Depreciation—Equipment		1,000
	Record 3 months' depreciation ($4,000 × 3 / 12).		

Step 2: Record sale of asset at a loss. ($3,000 − $2,500 = $500 loss)

Mar. 31	Cash	2,500	
	Loss on Disposal of Equipment	500	
	Accumulated Depreciation—Equipment	13,000	
	Equipment		16,000
	Record sale of equipment for a $500 loss.		

Learning selling an asset.

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Learning Objective P3

Account for natural resource assets and their depletion.

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Natural Resources

Total cost is charged to depletion expense over periods benefited.

Extracted from the natural environment and reported at cost less accumulated depletion.

Examples: oil, coal, gold

Learning Objective P3: Account for natural resource assets and their depletion.

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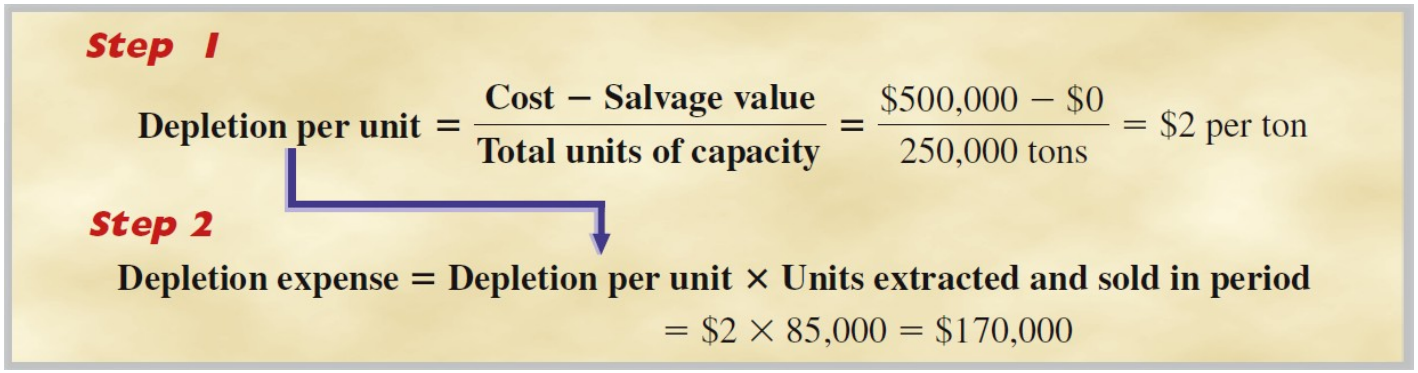
Cost Determination and Depletion

A mineral deposit with an estimated 250,000 tons of available ore is purchased for $500,000, and we expect zero salvage value. The depletion charge is $2 per ton. If 85,000 tons are mind and sold, the depletion charge is $170,000

Exhibit 10.16


Step 1
Depletion per unit = Cost − Salvage value / Total units of capacity = $500,000 − $0 / 250,000 tons = $2 per ton
Step 2
Depletion expense = Depletion per unit × Units extracted and sold in period
= $2 × 85,000 = $170,000

Learning Objective P3: Account for natural resource assets and their depletion.

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Depletion of Natural Resources

Depletion expense in the first year would be:

Dec. 31	Depletion Expense—Mineral Deposit	170,000	
	Accumulated Depletion—Mineral Deposit		170,000
	Record depletion of the mineral deposit.		

Exhibit 10.17

Balance Sheet presentation of natural resources:

Mineral deposit	$500,000	
Less accumulated depletion	170,000	$330,000

OR

Mineral deposit (net of $170,000 accumulated depletion)	$330,000

Learning Objective P3: Account for natural resource assets and their depletion.

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Depletion of Natural Resources: Journal Entry

Depletion expense when some ore remains unsold at year-end:

Dec. 31	Depletion Expense—Mineral Deposit	140,000
	Ore Inventory	30,000
	Accumulated Depletion—Mineral Deposit	170,000
	Record depletion and inventory of mineral deposit.	

Learning Objective P3: Account for natural resource assets and their depletion.

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Plant Assets Tied into Extracting

- Specialized plant assets may be required to extract the natural resource.
- These assets are recorded in a separate account and depreciated using the units-of-production method in the proportion to the depletion of the natural resource.

Learning Objective P3: Account for natural resource assets and their depletion.

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Learning Objective P4

Account for intangible assets.

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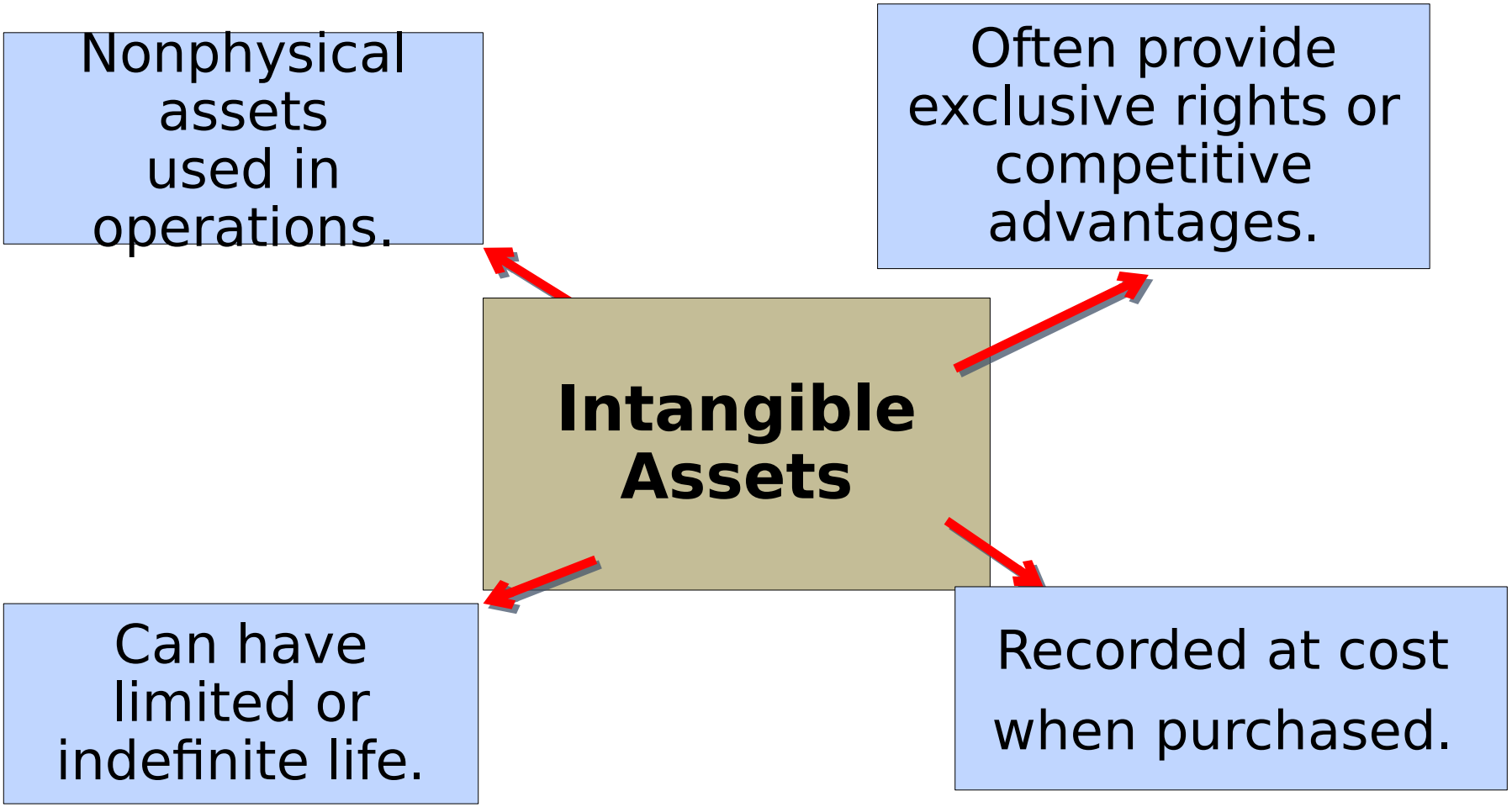
Intangible Assets


Nonphysical assets used in operations.
Often provide exclusive rights or competitive advantages.
Intangible Assets
Can have limited or indefinite life.
Recorded at cost when purchased.

Learning Objective P4: Account for intangible assets.

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Cost Determination and Amortization

Record at cost, including purchase price, legal fees, and filing fees.

- Patents
- Copyrights
- Franchises and Licenses
- Trademarks and Trade Names
- Goodwill
- Right-of-Use Asset (Lease)
- Leasehold Improvements
- Other Intangibles
- Research and Development

Learning Objective P4: Account for intangible assets.

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Patents, Copyrights, Franchises, and Licenses

- Patent –owner has exclusive right to manufacture and sell a patented item or use a process for 20 years.
- Copyright – gives owner exclusive right to publish and sell a musical, literary, or artistic work during the life of the creator plus 70 years.
- Franchises and licenses – rights to sell a product or service under specified conditions.

Learning Objective P4: Account for intangible assets.

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Goodwill and Leases

- Goodwill – amount by which company's value exceeds value of its individual assets and liabilities. Only recorded when entire company or business segment is purchased.
- Right-of-Use Asset (Lease) – property rented under a contract.
- Leasehold Improvements – improvements to leased property that are paid for by the lessee.
- Other Intangibles – incudes software, noncompete covenants, and customer lists.

Learning Objective P4: Account for intangible assets.

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Research and Development

Research and Development – expenditures to discover new products, processes, or knowledge.

- Costs are expensed when incurred.
- GAAP does not include them as intangible assets.

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Learning Objective A1

Compute total asset turnover and apply it to analyze a company's use of assets.

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Total Asset Turnover

Exhibit 10.18

Provides information about a company's efficiency in using its assets.

Company	Figure ($ millions)	Current Year	1 Year Ago	2 Years Ago
Starbucks	Net sales	$26,509	$24,720	$22,387
	Average total assets	$21,688	$19,261	$14,339
	Total asset turnover	**1.22**	**1.28**	**1.56**
Jack in the Box	Net sales	$950	$870	$1,097
	Average total	$891	$1,029	$1,290

Exhibit 10.19

Learning Objective A1: Compute total asset turnover and apply it to analyze a company's use of assets.

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Learning Objective P5

Appendix 10A
Account for asset exchanges.

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Exchanging Plant Assets

- Many plant assets such as machinery, automobiles, and office equipment are exchanged for newer assets.
- In an exchange, a trade-in allowance is received on the old asset and the balance is paid in cash.
- Accounting for the exchange of assets depends on whether the transaction has commercial substance.

Commercial substance implies the company's future cash flows will be altered.

Learning Objective P5: Account for asset exchanges.

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Exchange with Commercial Substance

- A company acquires $42,000 in new equipment.
- In exchange, the company pays $33,000 cash and trades in old equipment.
- The old equipment originally cost $36,000 and has accumulated depreciation of $20,000 (book value is $16,000).
- This exchange has commercial substance. The old equipment has a trade-in allowance of $9,000.

Exhibit 10A.1

Asset Exchange Has Commercial	Loss		Gain	
Market value of asset received		$42,000		$42,000
Book value of assets given:				
Equipment ($36,000 − $20,000)	$16,000		$16,000	
Cash	33,000	49,000	23,000	39,000
Gain (loss) on exchange		**$(7,000)**		**$ 3,000**

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Exchange with Commercial Substance: Journal Entry for a Loss

- A company acquires $42,000 in new equipment.
- In exchange, the company pays $33,000 cash and trades in old equipment.
- The old equipment originally cost $36,000 and has accumulated depreciation of $20,000 (book value is $16,000).
- This exchange has commercial substance. The old

Jan. 3	Equipment (**new**)	42,000	
	Loss on Exchange of Assets	7,000	
	Accumulated Depreciation—Equipment (**old**)	20,000	
	Equipment (**old**)		36,000
	Cash		33,000
	Record exchange (with commercial substance) of old equipment and cash for new equipment.		

Learning Objective P5: Account for asset exchanges.

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Exchange With Commercial Substance: Journal Entry for a Gain

Let's assume the same facts as on the previous screen except that the company pays $23,000 cash with the trade-in.

Jan. 3	Equipment (**new**)	42,000	
	Accumulated Depreciation—Equipment (**old**)	20,000	
	Equipment (**old**)		36,000
	Cash		23,000
	Gain on Exchange of Assets		3,000
	Record exchange (with commercial substance) of old equipment and cash for new equipment.		

Learning Objective P5: Account for asset exchanges.

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End of Chapter 10

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